I. Introduction

Over the years one of the more illusive questions posed to and by the Navy concerns the economic benefits to the United States and allied countries provided by U.S. Naval forward presence. Forward presence enables timely crisis response. While most authorities on the subject contend that these benefits are significant, their measurement has always been fraught with conceptual and computational difficulties. The greatest difficulty has always involved developing a convincing counterfactual argument about what the state of affairs would have been in the absence of timely crisis response by forward-engaged naval forces.

I.1 Background

The issue came to the fore in preparing for the Congressionally-mandated 1997 Quadrennial Defense Review (QDR). Early in the QDR preparations, Navy leaders asked if the economic benefits of forward-engaged naval forces could be quantified and thereby communicated to policy makers. Until this point, the only evidence of such benefits was anecdotal (System Planning Corporation 1996). The Naval Postgraduate School was tasked to develop new methodologies directed toward the quantification of these benefits.

The methodology ultimately developed focused on the effect of naval forward presence and crisis response on world oil prices, as reflected by oil futures markets (Naval Postgraduate School 1997). Using a vector autoregression econometric model, the approach then linked the oil price effects associated with naval forward presence and crisis response to changes in major economic indicators.

I.2 Findings in the Previous Study

This methodology was then applied to three cases of naval crisis response: the opening stages of Desert Shield (1990 Gulf War); the Iraq-Kuwait border incident of October 1994; and the January 1987 Gulf Shipping Crisis. These crises varied in terms of the military threat posed to U.S. and allied interests, oil market conditions, business cycles and the general world economic climate, but a clear trend emerged from the analysis of each incident. When oil futures markets become aware of naval crisis response, oil prices decline.

By stabilizing and lowering prices in oil futures markets during these crises, naval crisis response provided significant benefits to the U.S. economy. These benefits are measured in terms of dollar losses that would have occurred in the absence of naval crisis response. Conservative estimates indicate that naval crisis response in the opening stages of Desert Storm provided $55.22 billion (1997 dollars) worth of economic benefits (Gross Domestic Product, GDP) to the United States. Similarly, naval crisis response during the 1994 Iraq-Kuwait border incident yielded $7.13 billion (1997 dollars) in benefits, while naval crisis response during the 1987 Gulf Shipping Crisis produced $5.01 billion (1997 dollars) in benefits. Naval crisis response not only had a positive impact on the U.S. economy, but also on the economy of America's allies. Naval crisis response in the opening states of Desert Storm alone is likely to have provided up to a $86.80 billion (1997 dollars) increase in world income (GDP).

To summarize, several major findings emerged from this research:

- Most important, it is possible to develop procedures to quantitatively measure some of the economic impacts of naval crisis response.

- Economic impacts can be measured in terms of dollar cost savings and or additional dollar resources available to the economy.

- These economic impacts can be significant. They may also persist over a fairly long time period and across the economies of a large number of US allies.

- While these initial estimates of the economic benefits associated with naval crisis response are high, it is apparent that they underestimate the complete benefits associated with crisis response. One can simply not put a hard figure on the benefits from the many crises no doubt prevented by the mere forward presence of the Navy.

The study concluded that economic benefits associated with naval forward presence in the Gulf region would most likely outweigh the costs associated with these operations. Albeit without hard analysis, it was concluded that in the future, given the nature of oil markets, naval forward presence probably would continue to yield significant economic gains.

The FY97 study has been widely circulated and critiqued, and the economic analysis described above has been well received. The methodology developed and applied to the Desert Storm case has been accepted for publication in the professional peer-reviewed academic journal Interfaces.

1.3 Relevance for the Current Study

As is the case with most first attempts, the NPS Report has distinct strengths and weaknesses. The strength of the analysis lies in its analytical methodology linking naval crisis response to movements in oil futures prices. This linkage creates a credible counterfactual argument of what oil prices would likely be in the absence of naval intervention. While there are still several conceptual problems to be resolved (mainly relating to other factors that might influence oil prices), these linkages have withstood detailed scrutiny. The weaknesses of the study include a relatively small sample of cases taken from one, albeit important, region of the world. In addition, given time constraints, other markets (exchange rates, commodity markets and the like) that might also have been affected by naval movements (thus providing additional benefits to the U.S. economy) were not systematically examined.

The current study was undertaken to address these limitations while, at the same time strengthening, and extending our basic methodology. Specifically in the first study:

- The links between naval movements and oil prices were largely inferred from the movements in oil spot rates together with movements in the gap between the first and second forward contract (a standard measure of the market's assessment of risk). While this approach is on solid theoretical ground, one might argue that one or more other events associated with the crisis were responsible for these price movements. To overcome this limitation, the current study takes all of the events (naval and non-naval) surrounding a crisis and tests them econometrically to determine their statistical association with oil prices.

- Event analysis is also used to test different hypotheses concerning the market's response to announced naval movements. Specifically we test the alternative view commonly held that naval movements generate concern over potential conflicts in a region, thus precipitating oil price increases. That hypothesis is conclusively shown to be false.

- While the earlier study found strong linkages between naval movements and oil prices, one might argue these associations were simply overnight effects. Given the volatility of commodity markets, naval crisis response impacts could be quickly reversed thus producing little in the way of a long-term impact on economic activity in the United States. While our use of forward markets overcame this criticism, we have extended the analysis even further in an attempt to statistically verify the existence of long-run price movements resulting from naval crisis response.

- To this end, the current study uses a relatively new econometric technique, cointegration analysis, to test for long-run associations. Specifically, is there an association between naval events and markets that tends to modify the movement of prices over long periods of time? Are these periods sufficiently long so that naval events have a significant impact on economic activity in the United States? The analysis clearly shows that both are the case.

- As noted above, given time limitations, the initial study focused exclusively on oil markets. Certainly there are number crises in regions where oil markets are not seemingly involved. The issue is whether there are other markets or indirect effects on oil markets that naval events might impact that are capable of ultimately producing non-trivial benefits for the US economy? The current study extends the first by systematically introducing other commodity markets, exchange rates and share markets into the analysis.

- The cases in the original study were all drawn from the Arabian Gulf. Here the issue is whether or not this biased the conclusions drawn. Is the Gulf unique to the extent that few generalizations can be drawn for other parts of the world? To address this issue several cases outside the Gulf were selected: the Taiwan Strait crisis of 1996 and the Libyan crisis of early 1986.

- Finally, the first study focused on individual cases without assessing the extent to which changing world economic conditions, globalization and the like might alter the outcome if similar events occurred in the future. To overcome this limitation the current study examines the links between naval forward presence and crisis response, and globalization. The issues examined include whether current trends in globalization strengthen or weaken the economic impacts associated with naval forward presence and crisis response? Does naval forward presence affect the economic environment associated with a particular state of globalization? Are naval forward presence and likely changes in globalization likely to aid or stifle economic growth in the United States?

As noted, the current study examines four additional cases to assess the extent to which the findings of our first study can be generalized. The cases were chosen to provide greater geographical diversity. In addition, care was taken to assure that these cases involved primarily naval units, with at best limited participation from the other services.

- The Taiwan Strait Crisis (1996) was selected because of its importance and also the fact that it did not appear to involve oil markets.

- Operation Desert Strike (1996) was chosen to see if a crisis of very short duration involving naval forces was capable of altering oil markets in a manner that resulted in a significant impact on the United States economy.

- Operation Desert Fox (1998) was selected because it represents a case where there was great uncertainty in oil markets concerning both Iraq's intentions and the consequences of naval actions.

- Libyan Operations (1986) was chosen because it represented a time in which oil markets were first developing sophisticated forward markets. Also represents a case close to Europe and thus possible links to exchange and share markets.

The next chapter describes the methodology developed in this study. That methodology is then applied to the analysis of the four cases described above. Chapter VII examines globalization and naval forward presence. A summary of the study's principal findings is provided in the final chapter.